

METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CP1

1/37

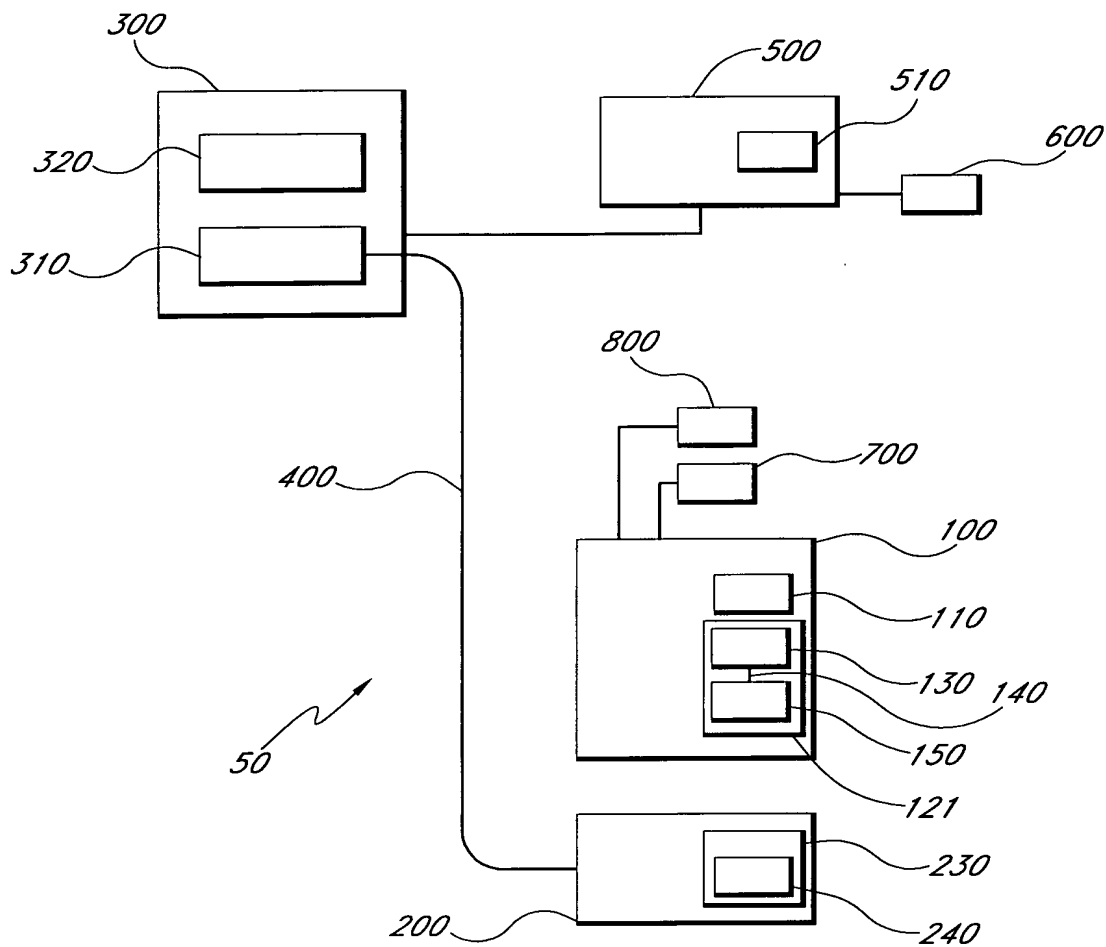


FIG. 1

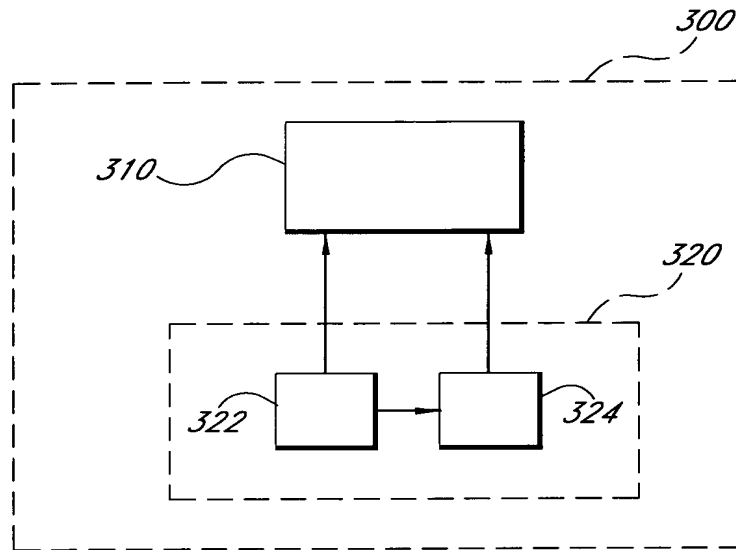


FIG. 2

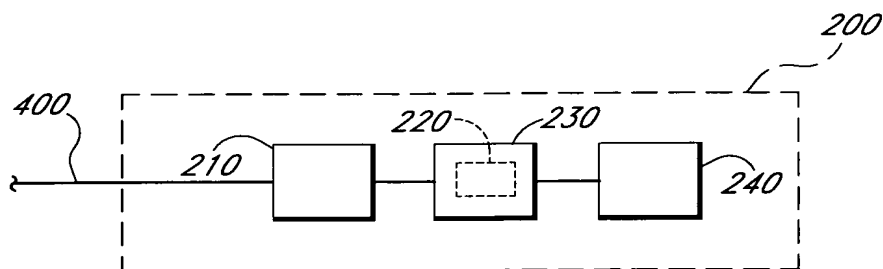


FIG. 3A

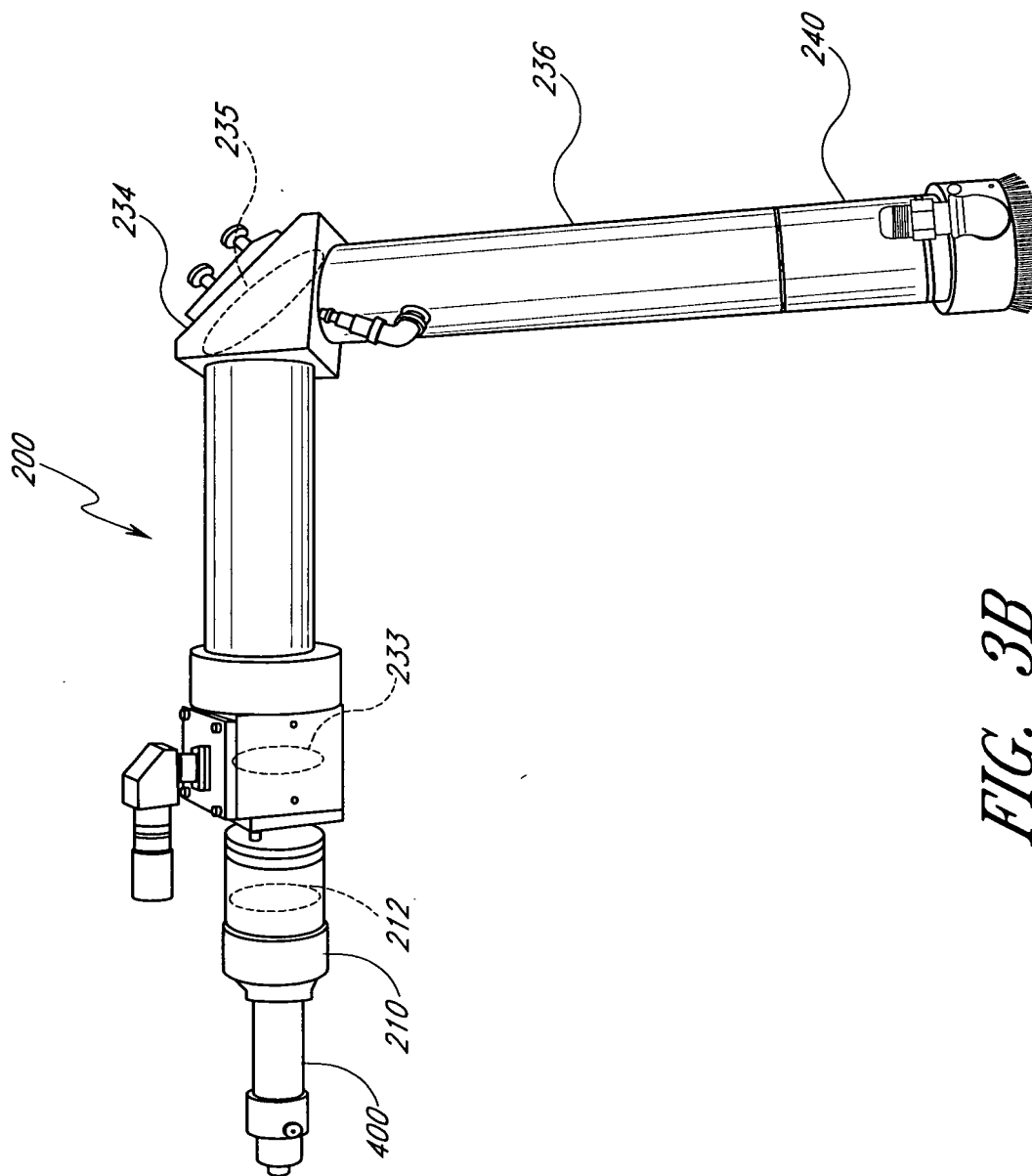


FIG. 3B

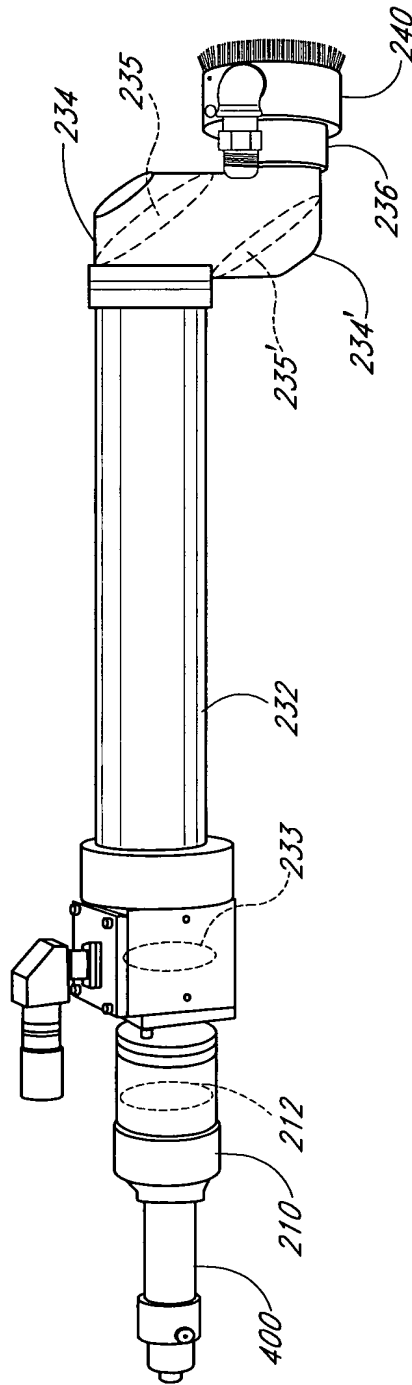


FIG. 3C

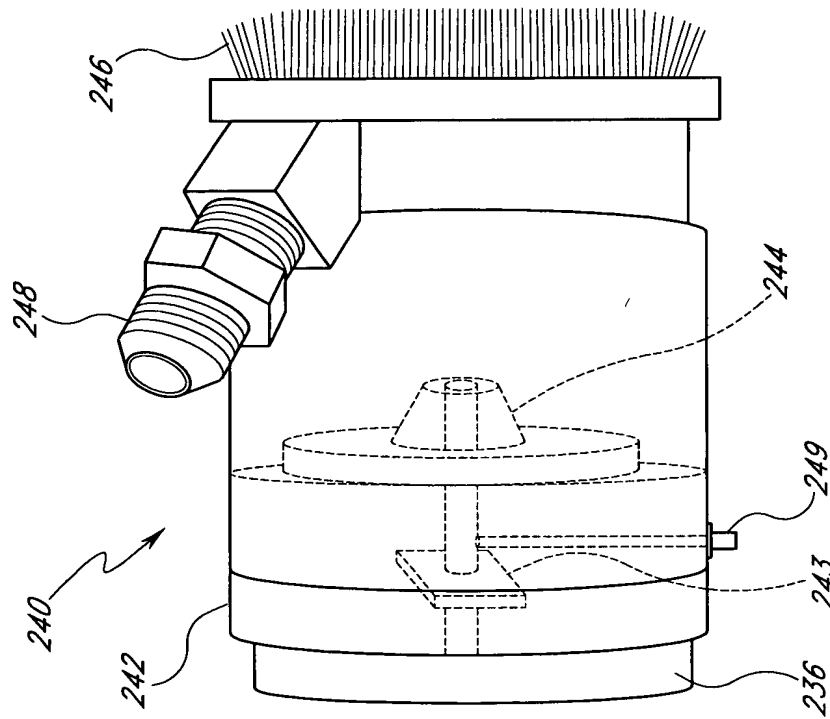


FIG. 4

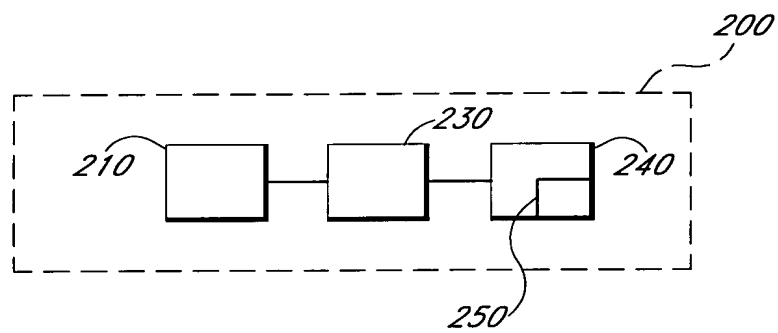


FIG. 5

METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CP1

8/37

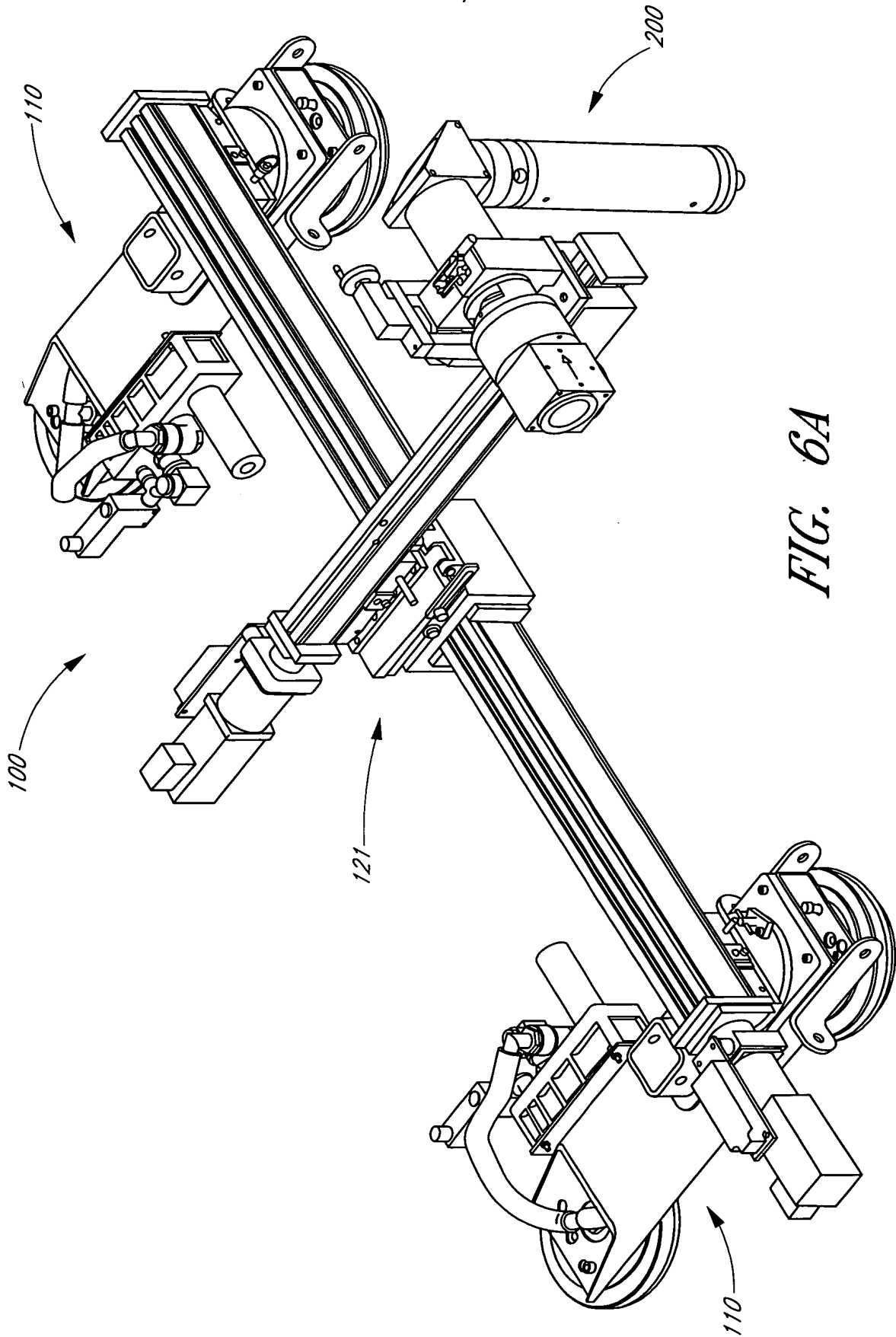


FIG. 6A

METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CPI

9/37

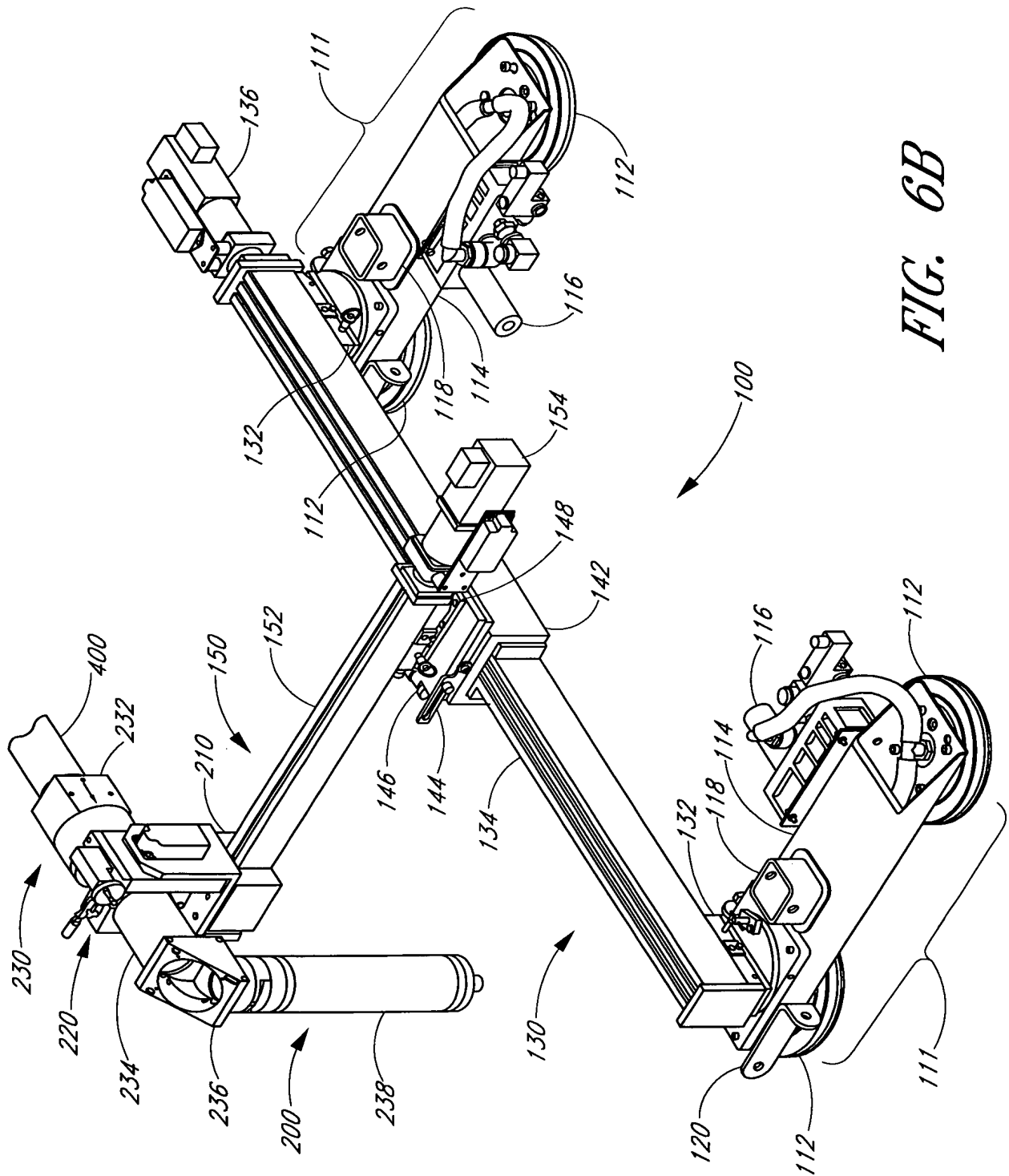
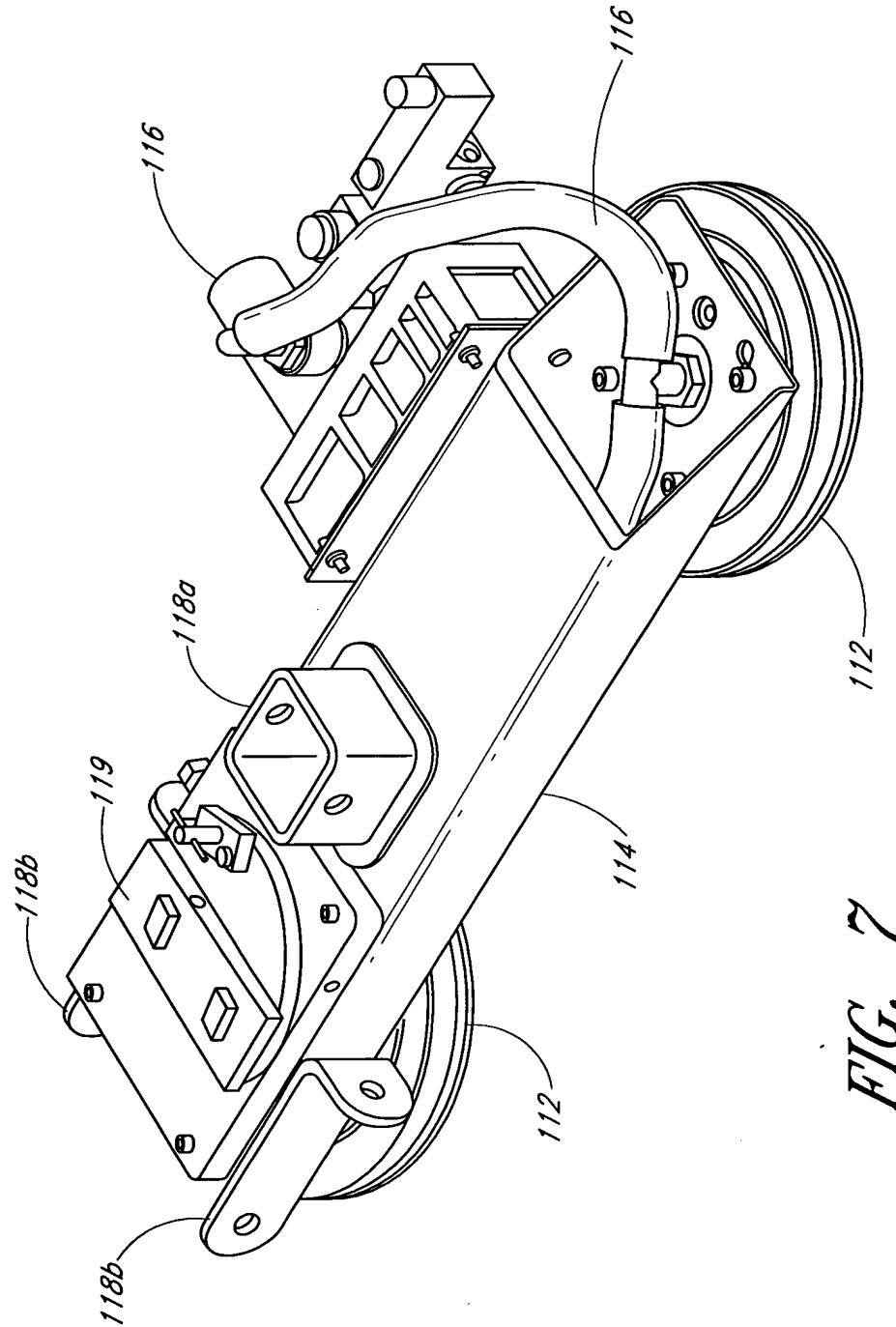


FIG. 6B



METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CP1

11/37

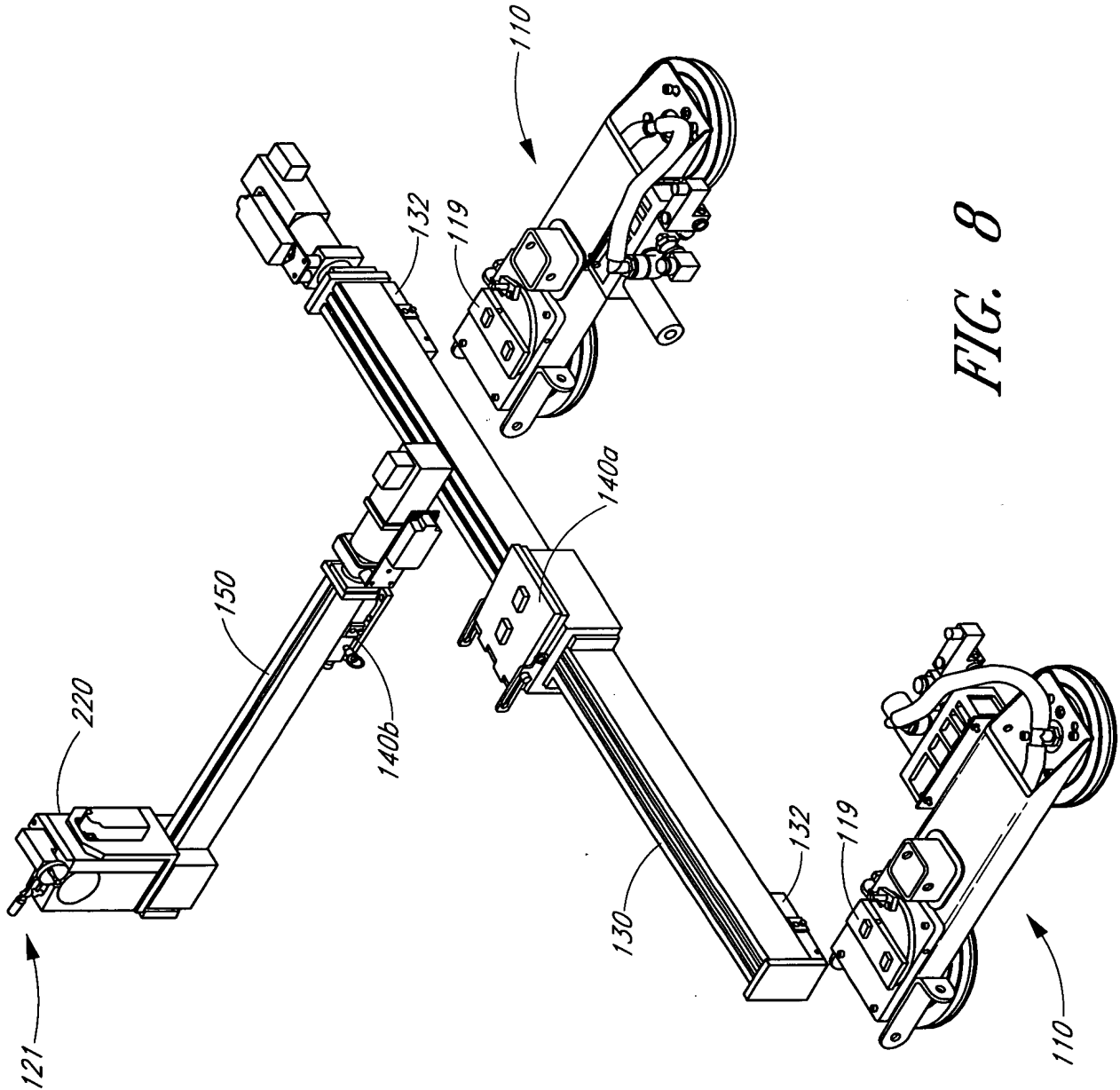


FIG. 8

12/37

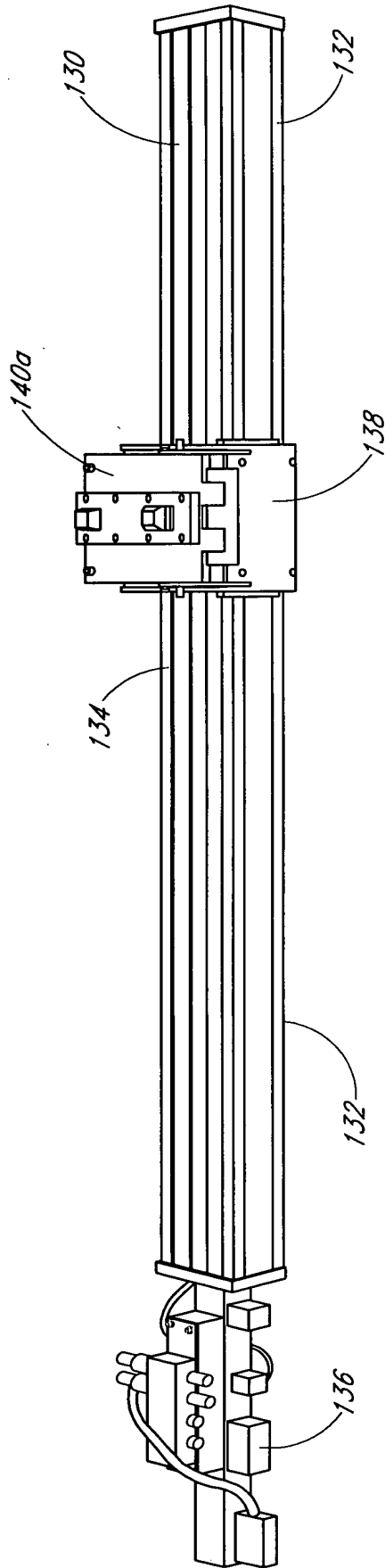


FIG. 9

13/37

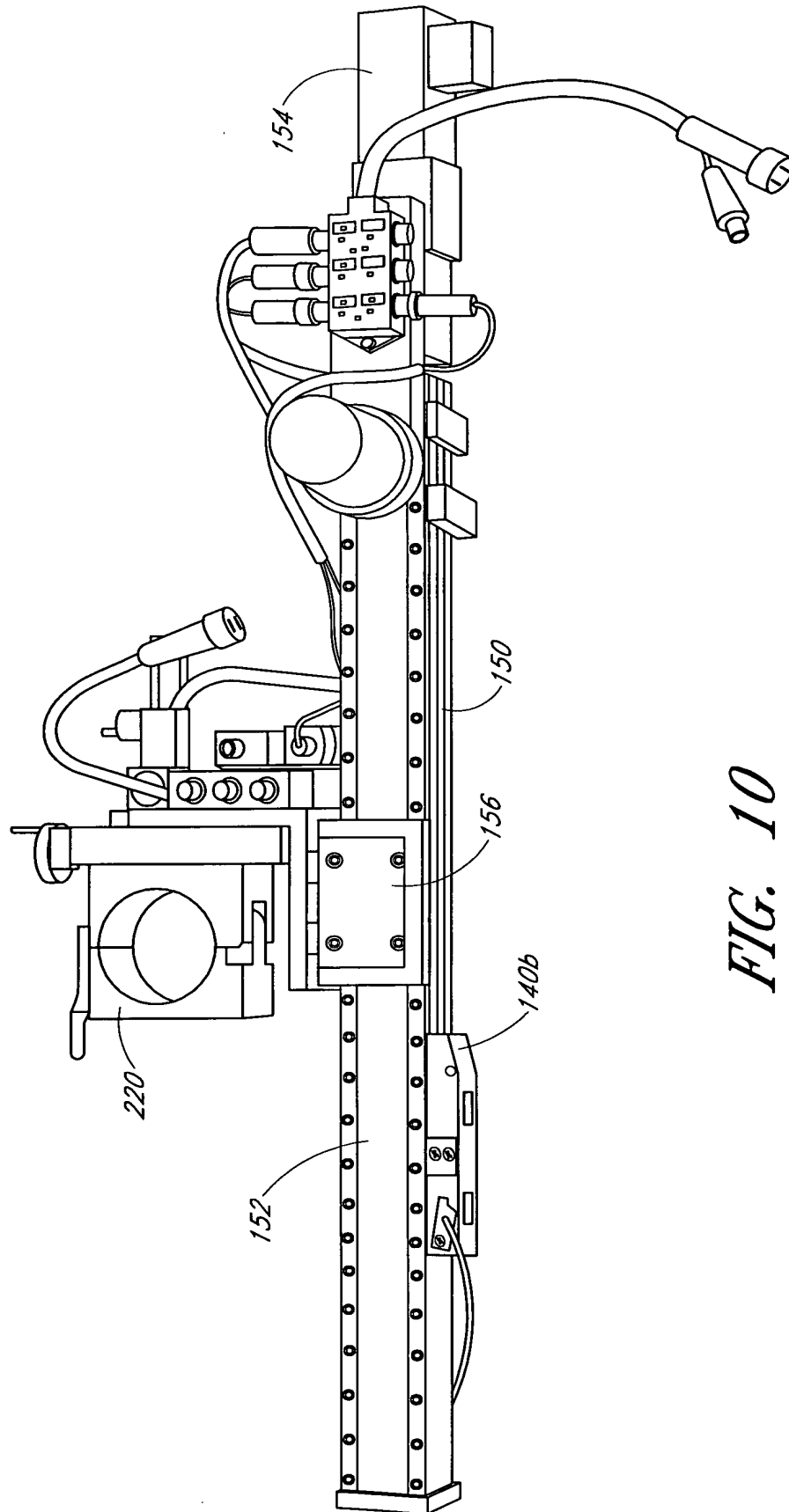
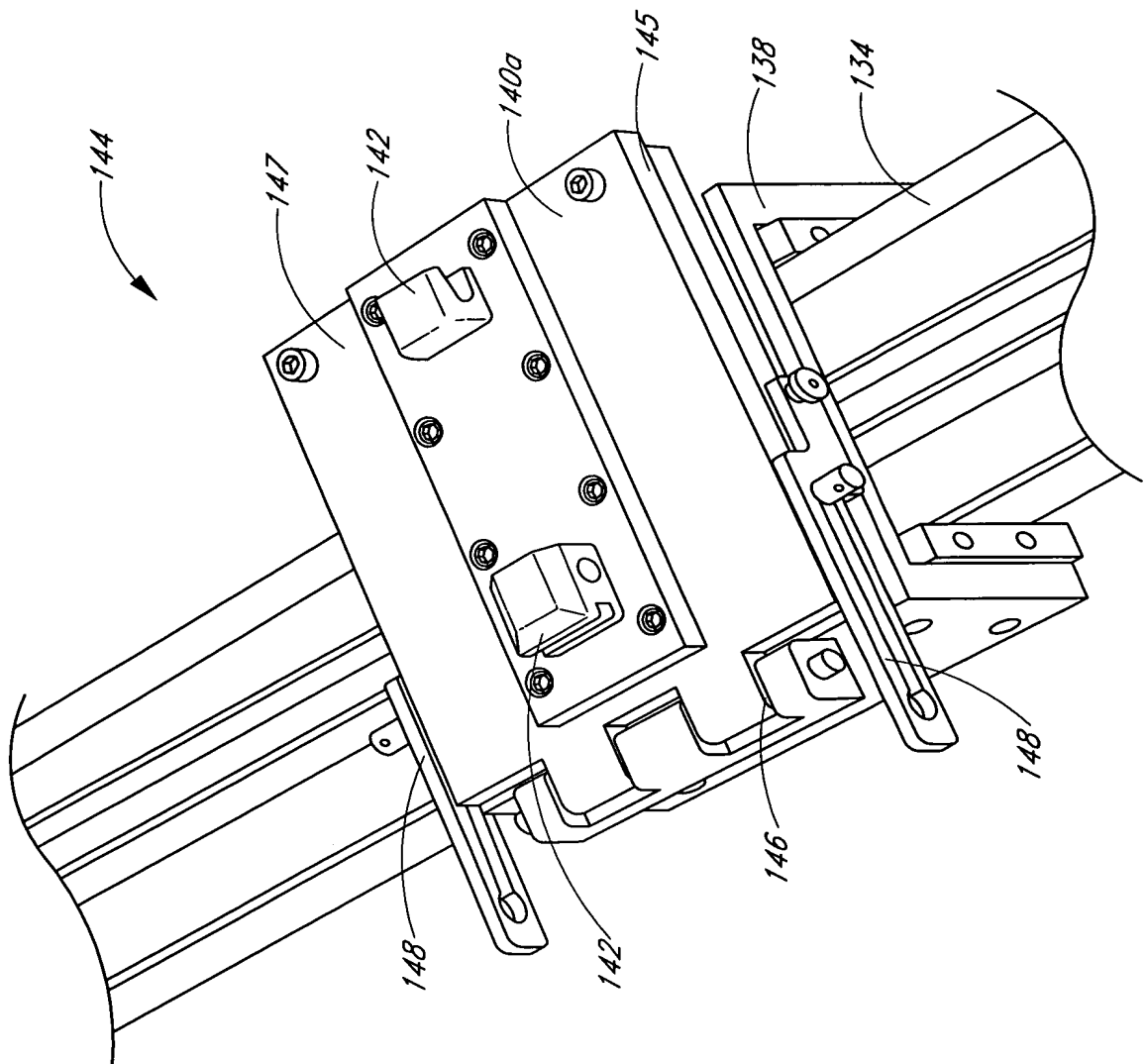


FIG. 10

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CPI

14/37

FIG. 11A



METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CP1

15/37

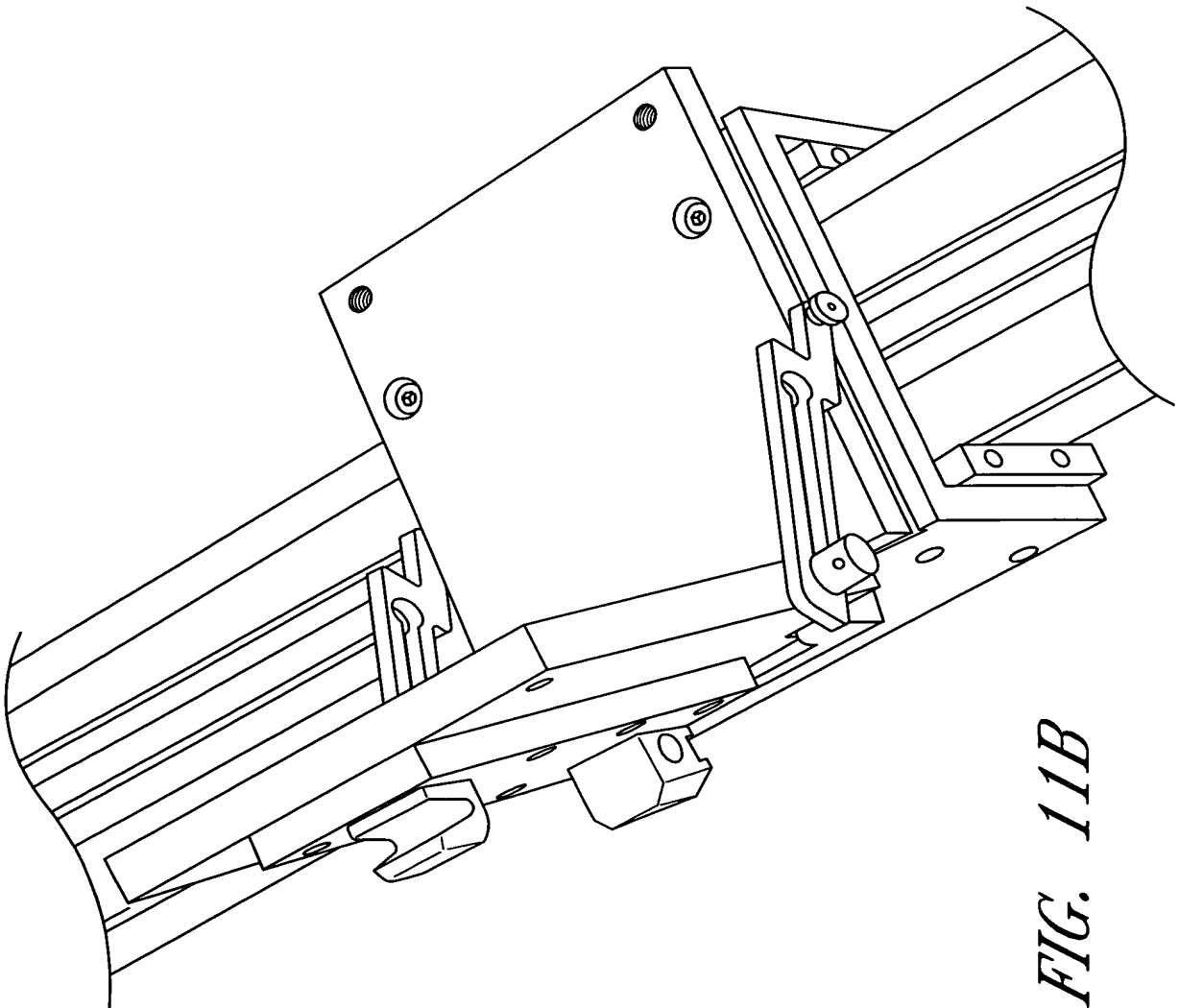


FIG. 11B

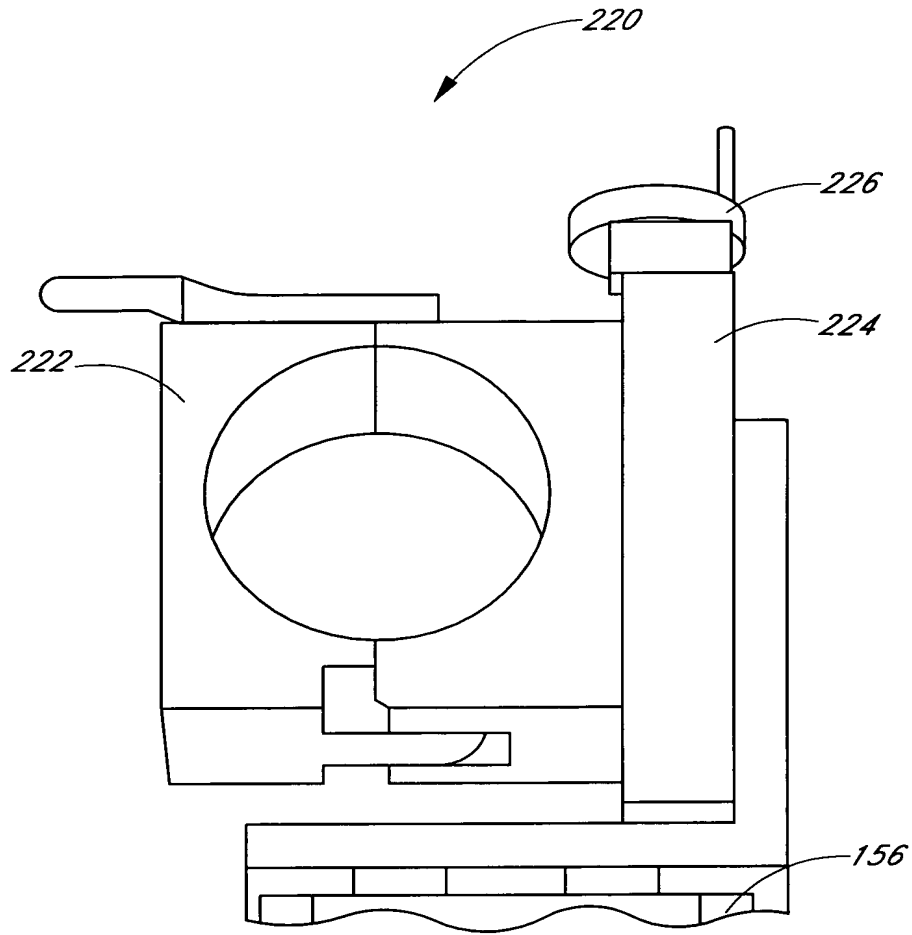


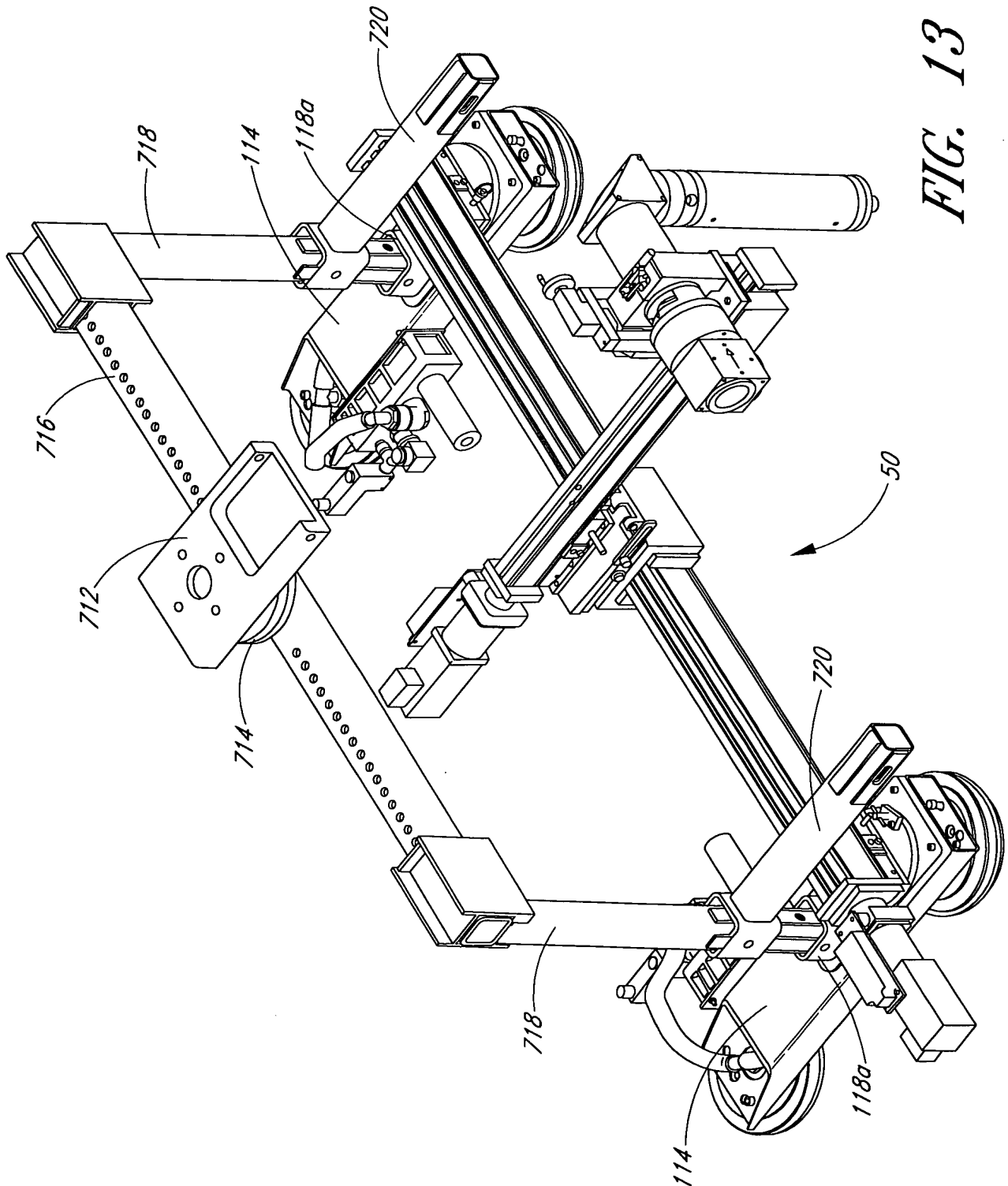
FIG. 12

METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CP1

17/37



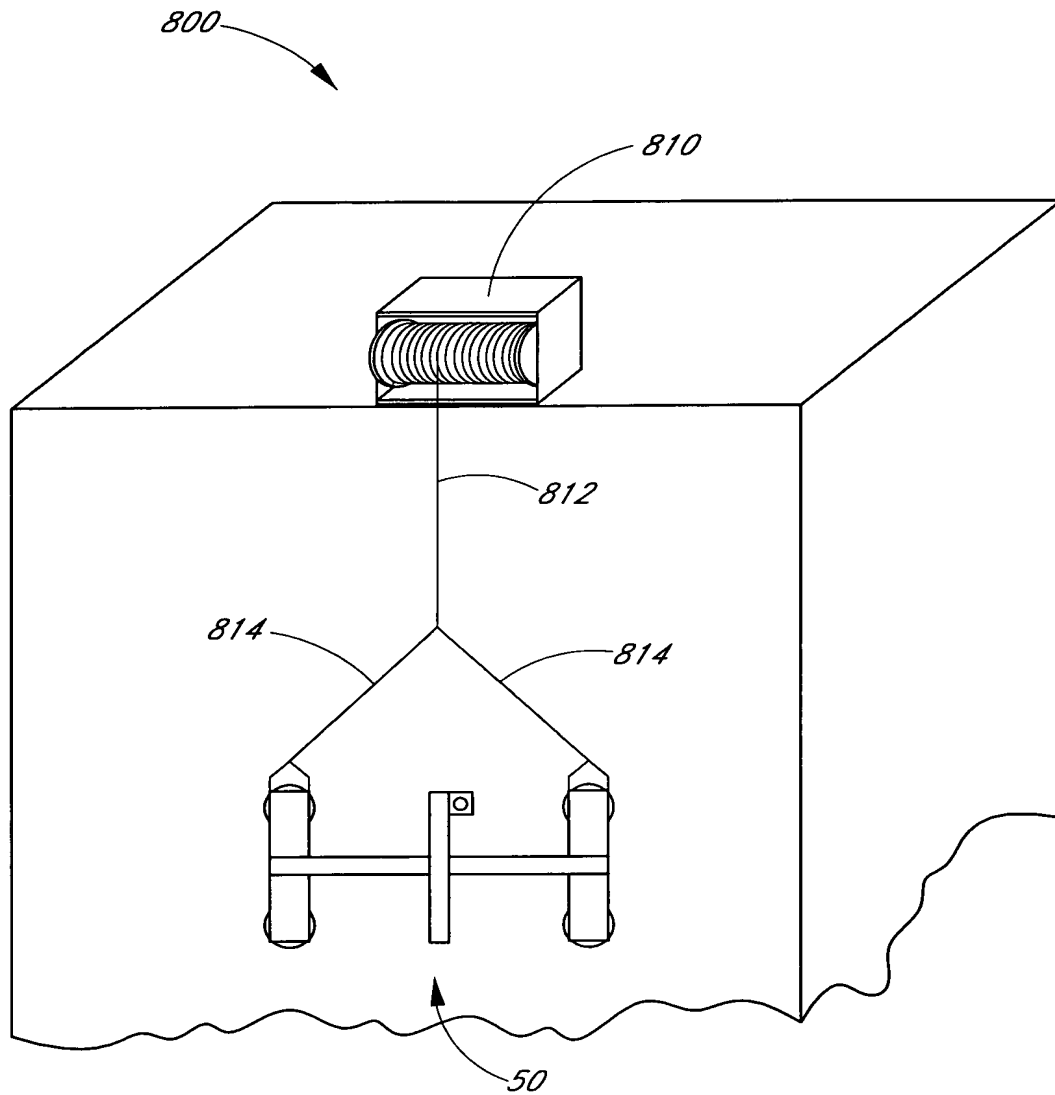


FIG. 14A

METHOD AND APPARATUS FOR MATERIAL PROCESSING

Paul E. Denney et al.

Appl. No.: 10/803,272 Atty Docket: LOMASR.021CP1

19/37

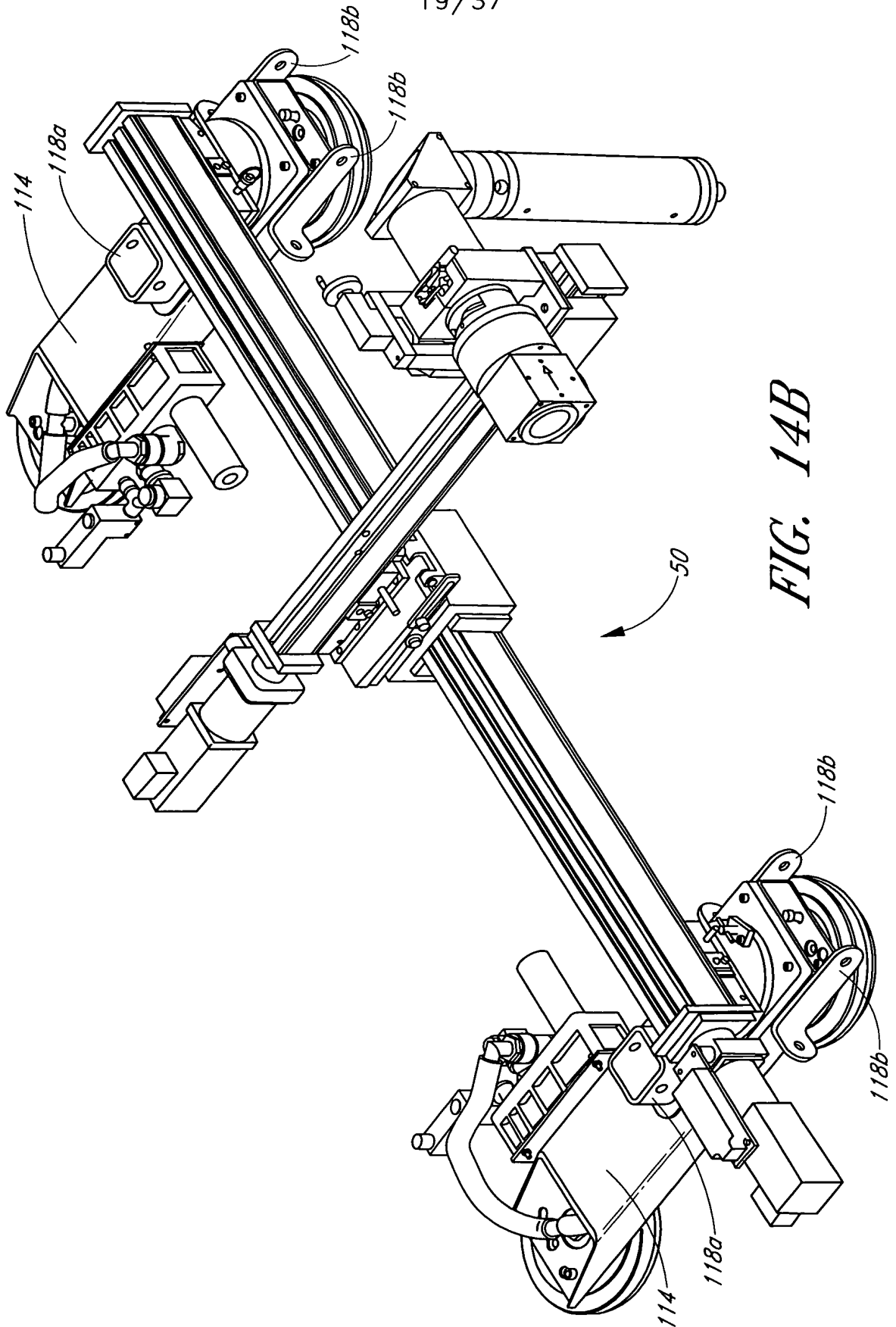


FIG. 14B

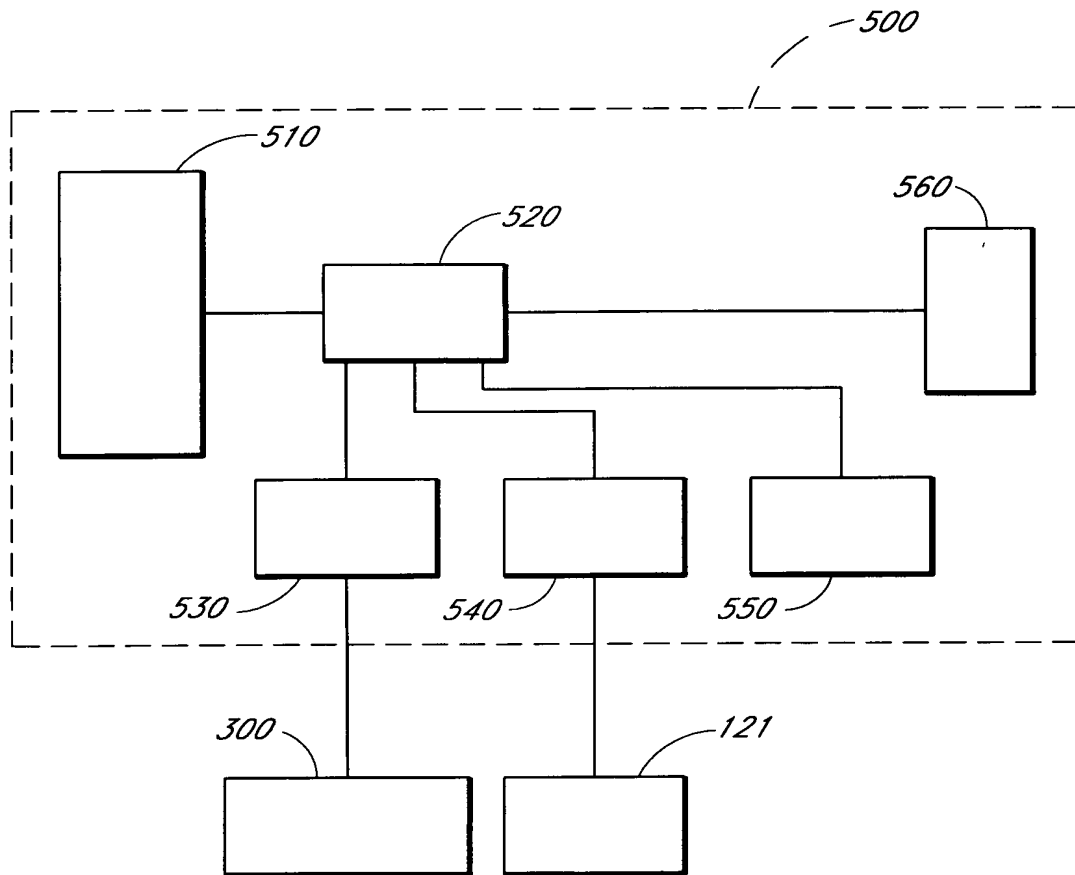


FIG. 15

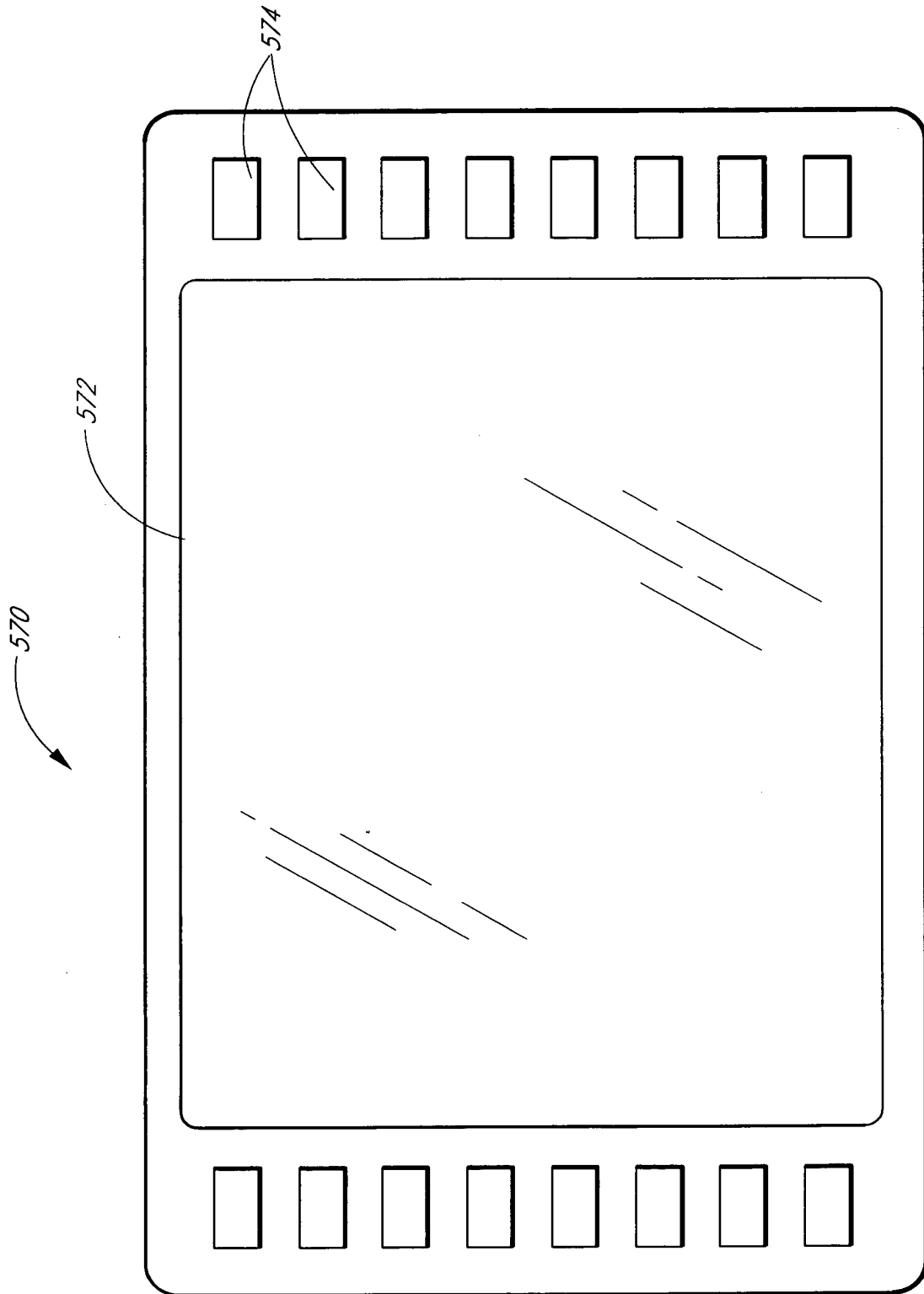


FIG. 16

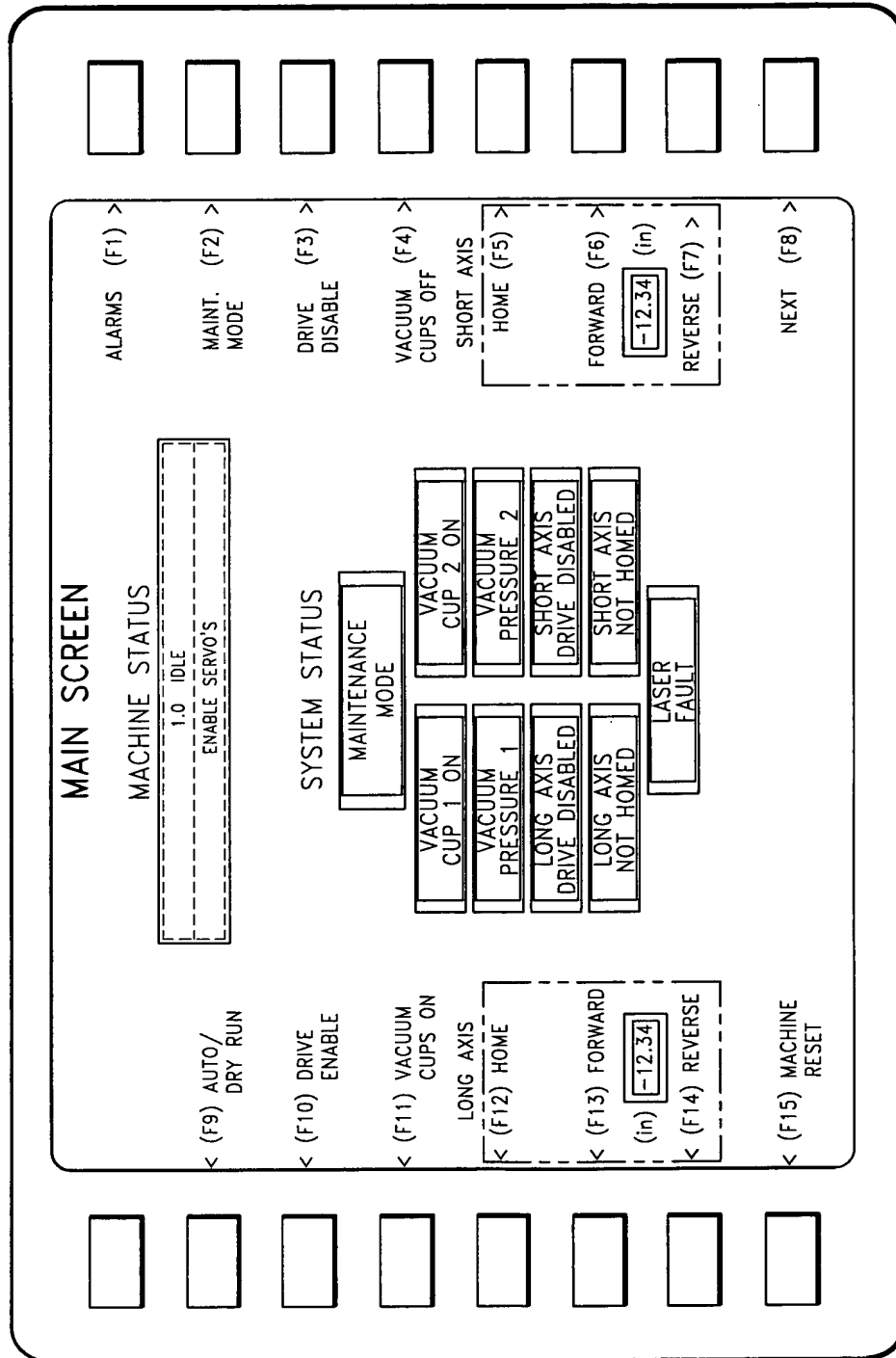


FIG. 17A

SELECT OPERATION SCREEN

MACHINE STATUS

1.0 IDLE
ENABLE SERVO'S

LONG AXIS POSITION

-12.34 (in)

SHORT AXIS POSITION

-12.34 (in)

SYSTEM STATUS

MAINTENANCE MODE

CIRCLE IDLE

PIERCE IDLE

STRAIGHT CUT IDLE

SURFACE KEYING IDLE

< (F9) AUTO/
DRY RUN

< (F11) CIRCLE

< (F12) PIERCE

< (F13) STRAIGHT CUT

< (F14) SURFACE
KEYING

< (F15) MACHINE
RESET

>

NEXT (F8)

FIG. 17B

CIRCLE SETUP/OPERATION SCREEN

< (F9) AUTO/
DRY RUN

MACHINE STATUS

1.0 IDLE
ENABLE SERVO'S

CIRCLE STATUS

2.0 CIRCLE SEQUENCE IDLE
PRESS CYCLE START TO BEGIN

< (F11) CYCLE
START

SYSTEM STATUS

MAINTENANCE
MODE

CIRCLE PARAMETERS

LONG AXIS
POSITION

-12.34 (in)

SHORT AXIS
POSITION

-12.34 (in)

> (F4) >
CYCLE STOP

PROGRAM NUMBER

DIAMETER (in)

STATUS -1.234
SET POINT -1.234

SPEED (in/min)

STATUS -12.34
SET POINT -12.34

REVOLUTIONS

STATUS 1234
SET POINT 1234
COUNT 123

< (F15) MACHINE
RESET

TIME (sec)

STATUS 1234
SET POINT 1234

NEXT (F8) >

FIG. 17C

PIERCE SETUP/OPERATION SCREEN

MACHINE STATUS

1.0 IDLE
ENABLE SERVO'S

PIERCE STATUS

3.0 PIERCE SEQUENCE IDLE
PRESS CYCLE START TO BEGIN

SYSTEM STATUS

MAINTENANCE
MODE

PIERCE PARAMETERS

LONG AXIS POSITION

-12.34 (in)

SHORT AXIS POSITION

-12.34 (in)

TIME (sec)

STATUS 1234
SET POINT 1234

LBU PROGRAM NUMBER

STATUS 12
SET POINT 12

< (F9) AUTO/
DRY RUN

< (F11) CYCLE
START

< (F15) MACHINE
RESET

CYCLE (F4) >
STOP

NEXT (F8) >

FIG. 17D

CUT SETUP/OPERATION SCREEN

< (F9) AUTO/
DRY RUN

MACHINE STATUS

1.0 IDLE
ENABLE SERVO'S

CUT STATUS

4.0 CUT SEQUENCE IDLE
PRESS CYCLE START TO BEGIN

< (F11) CYCLE
START

SYSTEM STATUS

MAINTENANCE
MODE

LONG AXIS
POSITION

-12.34 (in)

SHORT AXIS
POSITION

-12.34 (in)

< (F13) LONG
AXIS

SPEED (in/min)

STATUS -12.34
SET POINT -12.34

< (F14) SHORT
AXIS

LENGTH (in)

STATUS -12.34
SET POINT -12.34

< (F15) MACHINE
RESET

CUT PARAMETERS

PROGRAM NUMBER

STATUS 12
SET POINT 12

LONG AXIS
NOT SELECTED

SHORT AXIS
NOT SELECTED

NEXT (F8) >

CYCLE (F4) >
STOP

FIG. 17E

SURFACE KEYING SETUP/OPERATION SCREEN

< (F9) AUTO/
DRY RUN

MACHINE STATUS

1.0 IDLE

ENABLE SERVO'S

SURFACE KEYING STATUS

5.0 KEYING SEQUENCE IDLE

PRESS CYCLE START TO BEGIN

CYCLE (F4) >
STOP

SYSTEM STATUS

MAINTENANCE
MODE

SURFACE KEYING PARAMETERS

LONG AXIS
POSITION

-12.34 (in)

PROGRAM NUMBER

12

SHORT AXIS
POSITION

-12.34 (in)

SHORT AXIS
LENGTH (in)

-12.34

STATUS -12.34

SET POINT -12.34

STATUS -12.34

SET POINT -12.34

SPEED (in/min)

-12.34

OFFSET (in)

-12.34

< (F11) CYCLE
START

< (F15) MACHINE
RESET

NEXT (F8) >

FIG. 17F

FIG. 17G

MAINTENANCE SCREEN

WARNING:
OPERATION FROM THIS SCREEN
BYPASSES SYSTEM INTERLOCKS

SYSTEM STATUS

MAINTENANCE
MODE

VACUUM
CUP 1 ON

VACUUM
CUP 2 ON

VACUUM
PRESSURE 1

VACUUM
PRESSURE 2

LONG AXIS
DRIVE DISABLED

SHORT AXIS
DRIVE DISABLED

LASER AIR
SOLENOID OFF

LASER AIR
PRESSURE

LONG AXIS
NOT HOMED

SHORT AXIS
NOT HOMED

LASER
FAULT

ALARMS (F1) >

LASER AIR (F2) >
ON/OFF

DRIVE (F3) >
DISABLE

VACUUM (F4) >
CUPS OFF

SHORT AXIS

HOME (F5) >

FORWARD (F6) >
[-12.34] (in)

REVERSE (F7) >

NEXT (F8) >

< (F9) AUTO/
DRY RUN

< (F10) DRIVE
ENABLE

< (F11) VACUUM
CUPS ON

LONG AXIS

< (F12) HOME

< (F13) FORWARD
[-12.34] (in)

< (F14) REVERSE

< (F15) MACHINE
RESET

JOG SPEED
(in/min)

STATUS
[-12.34]

SET POINT
[-12.34]

FIG. 17H

30/37

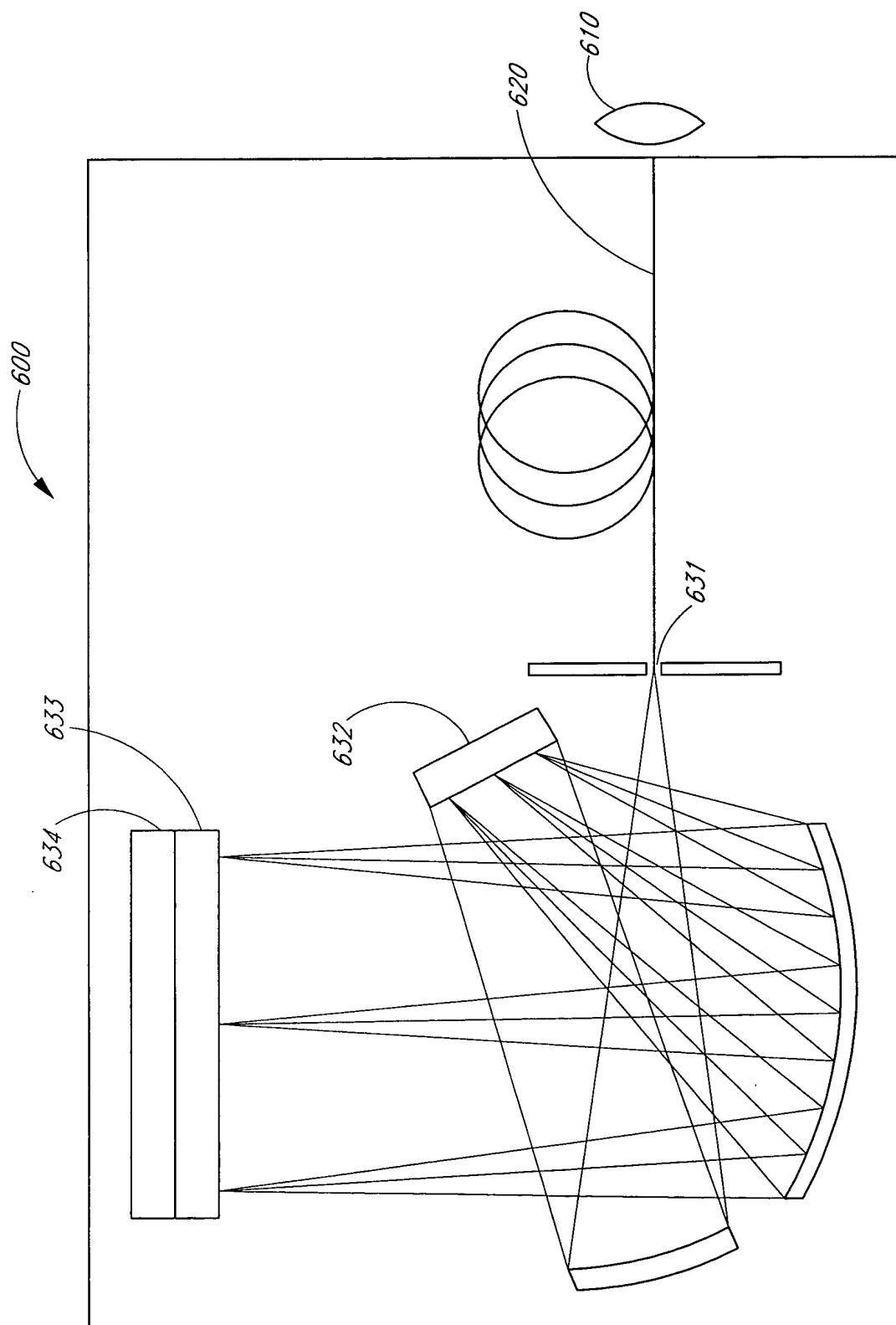


FIG. 18A

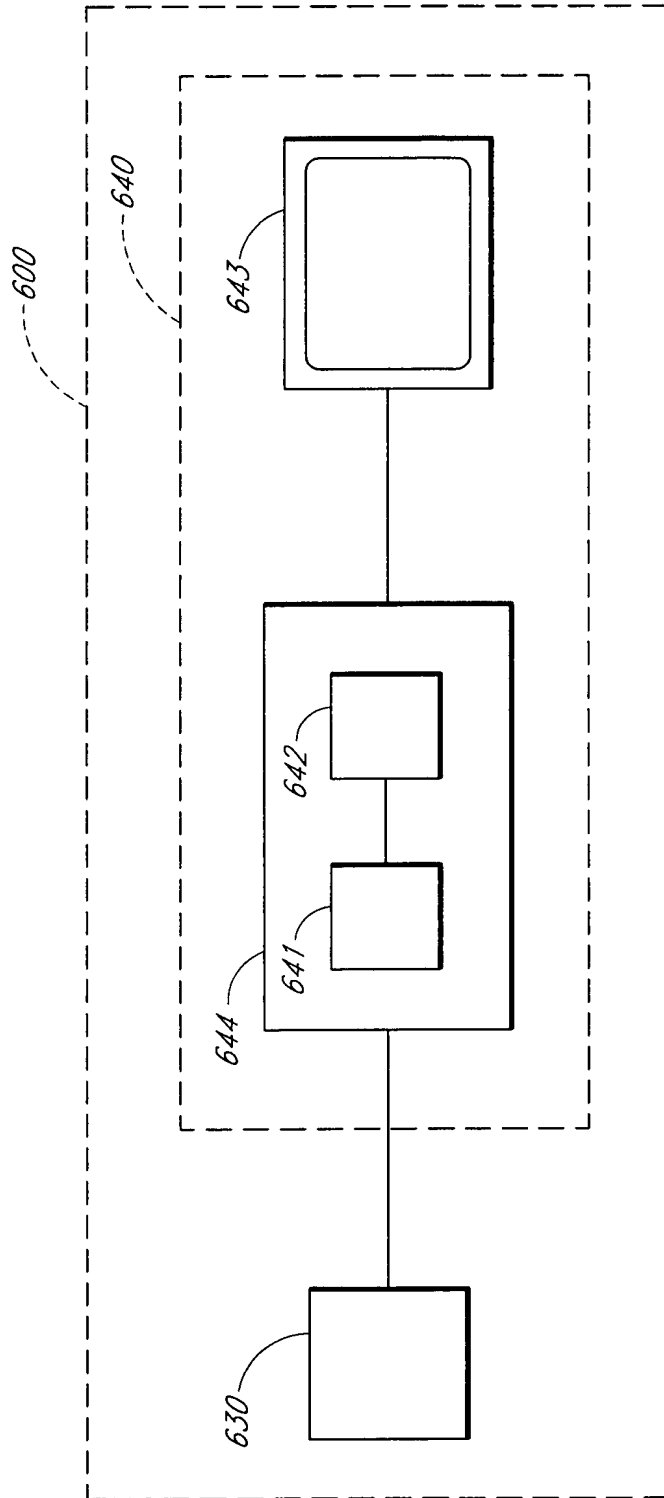


FIG. 18B

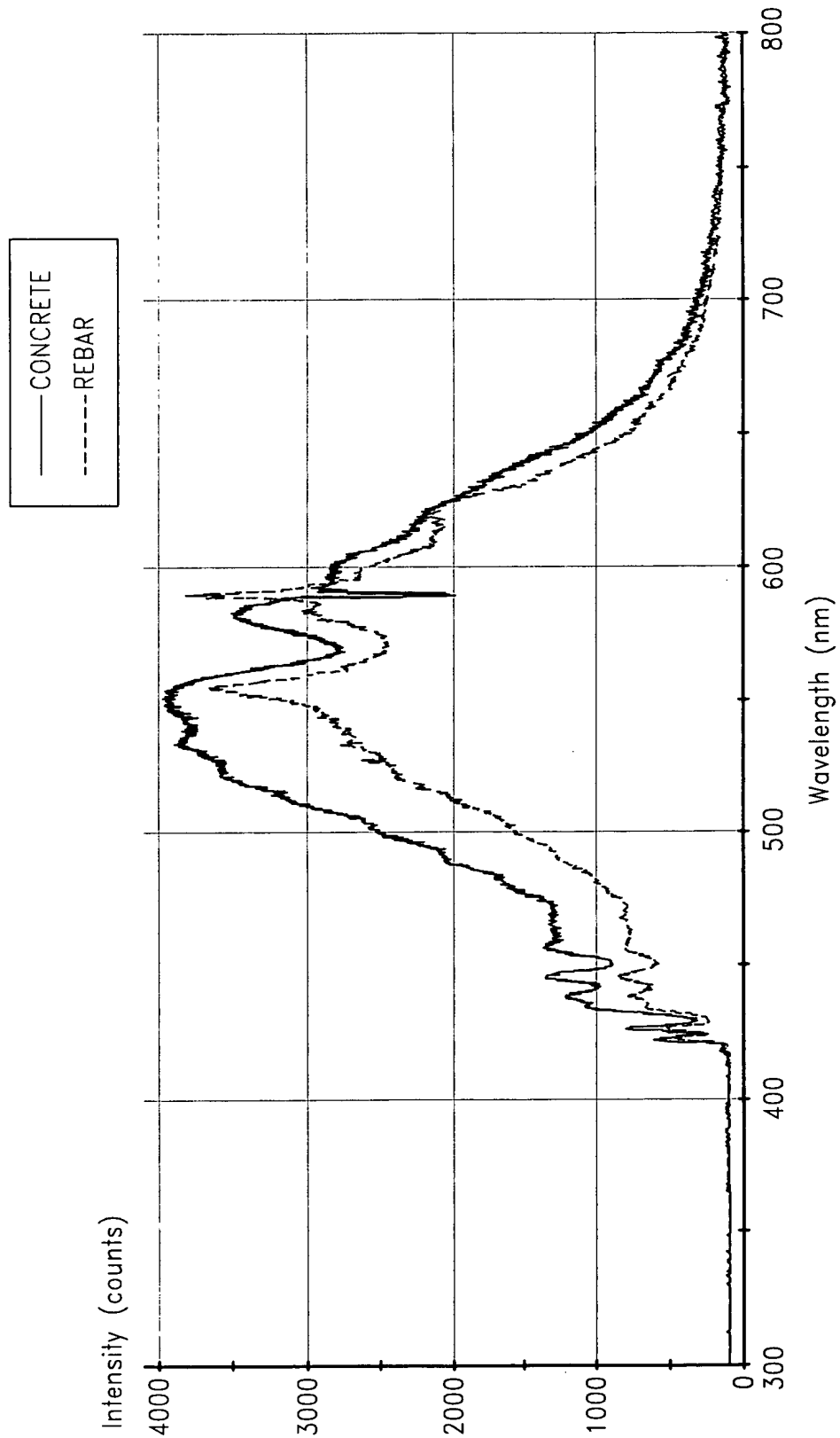


FIG. 19

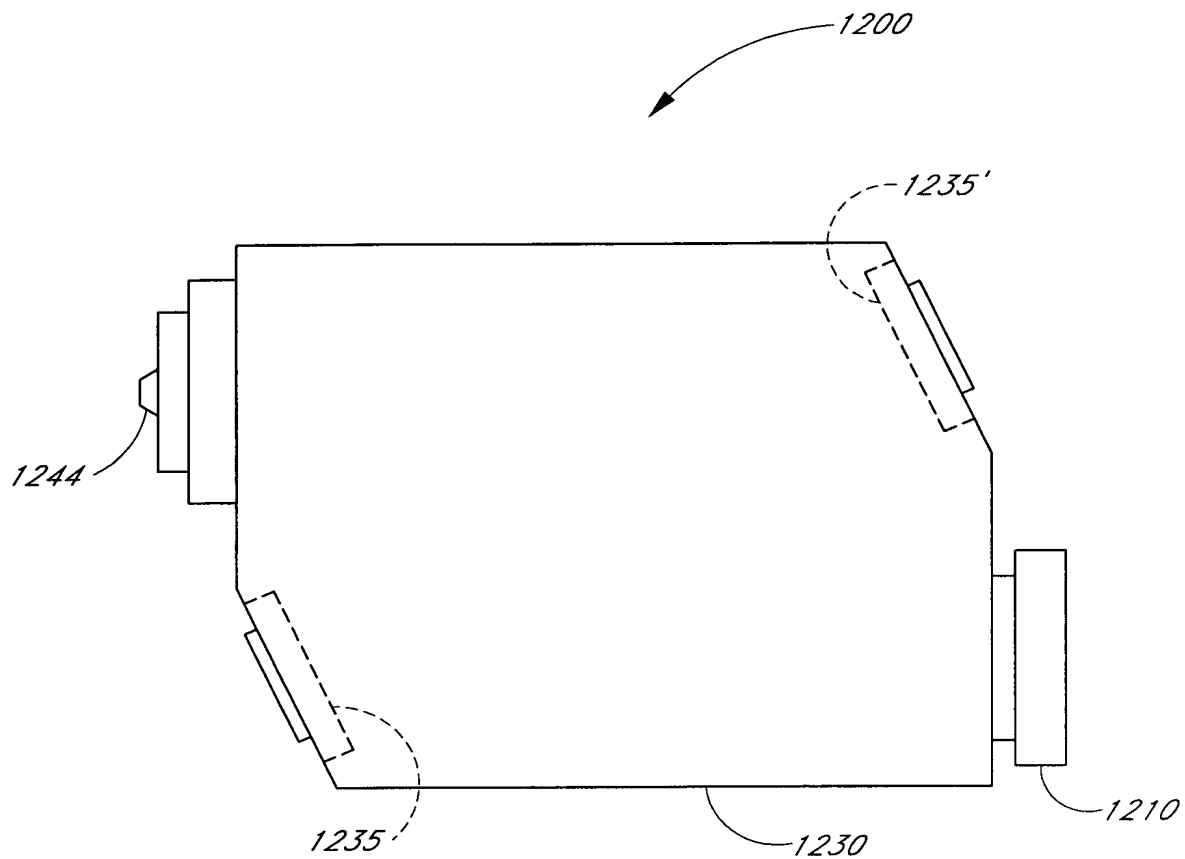


FIG. 20

FIG. 21A

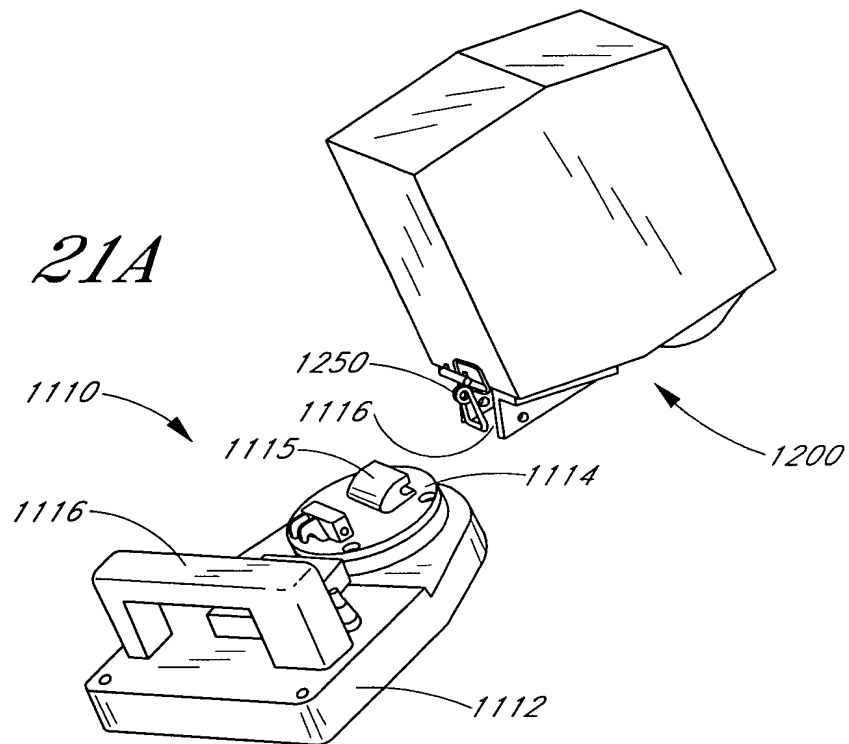
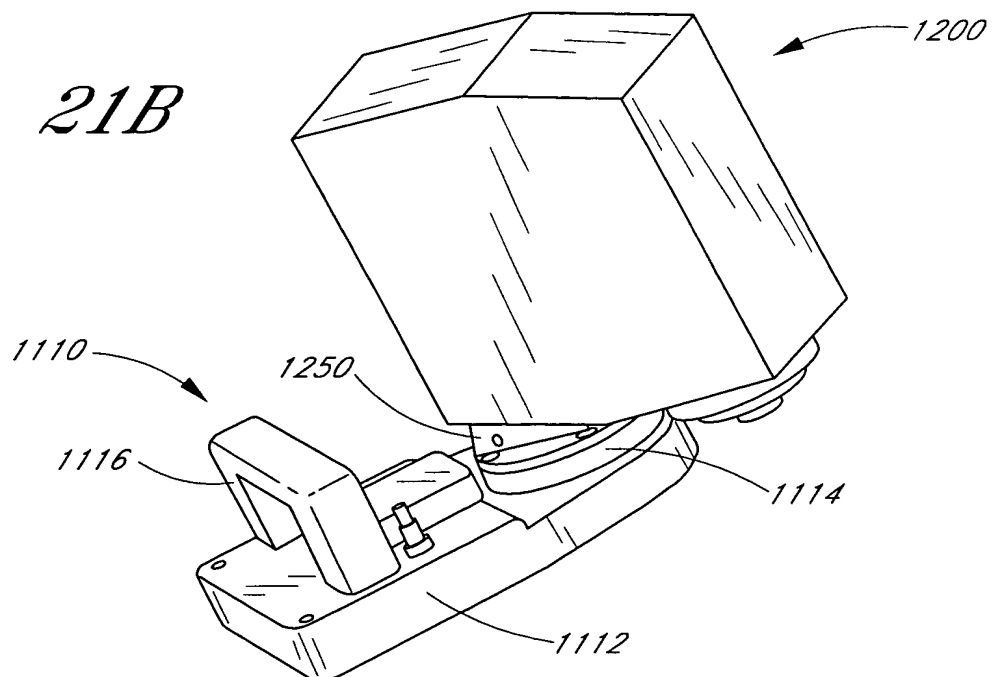


FIG. 21B



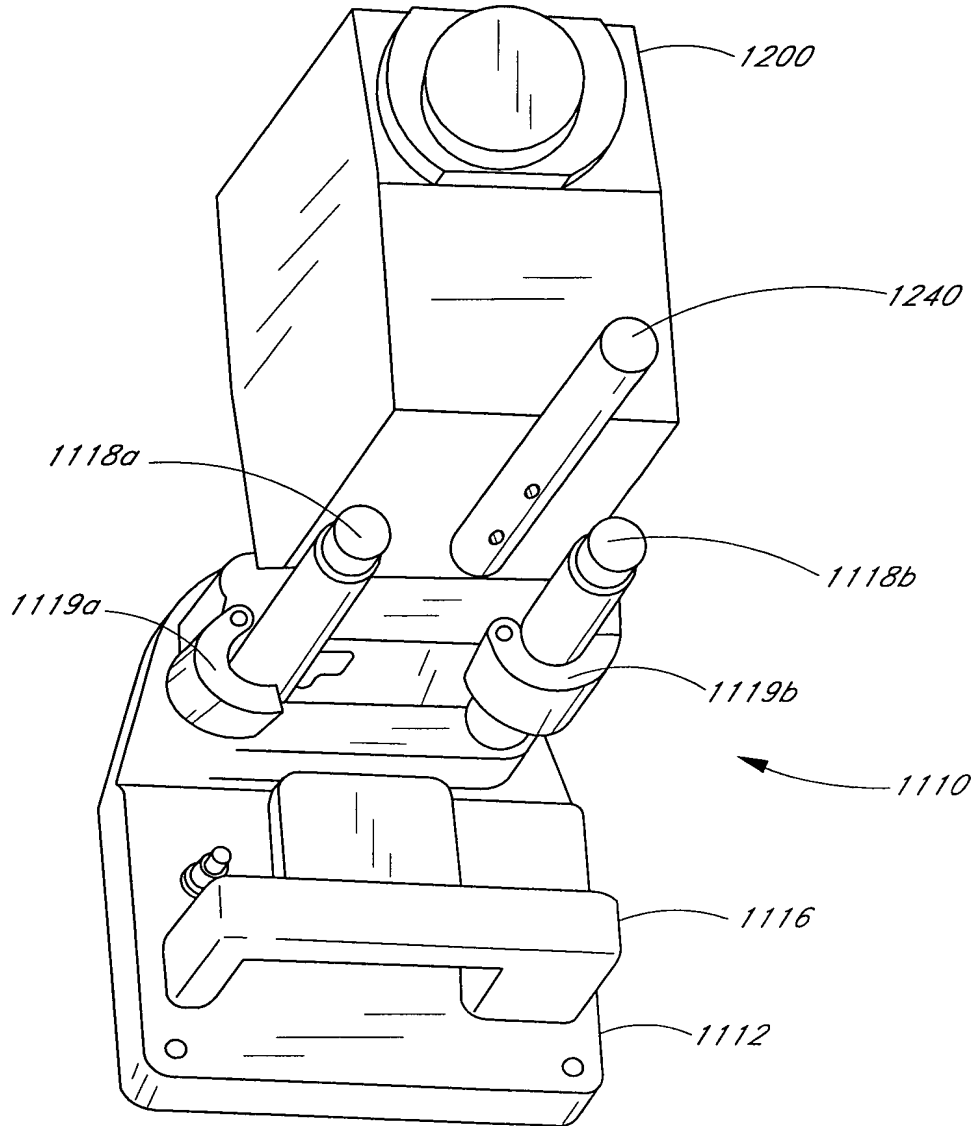


FIG. 21C

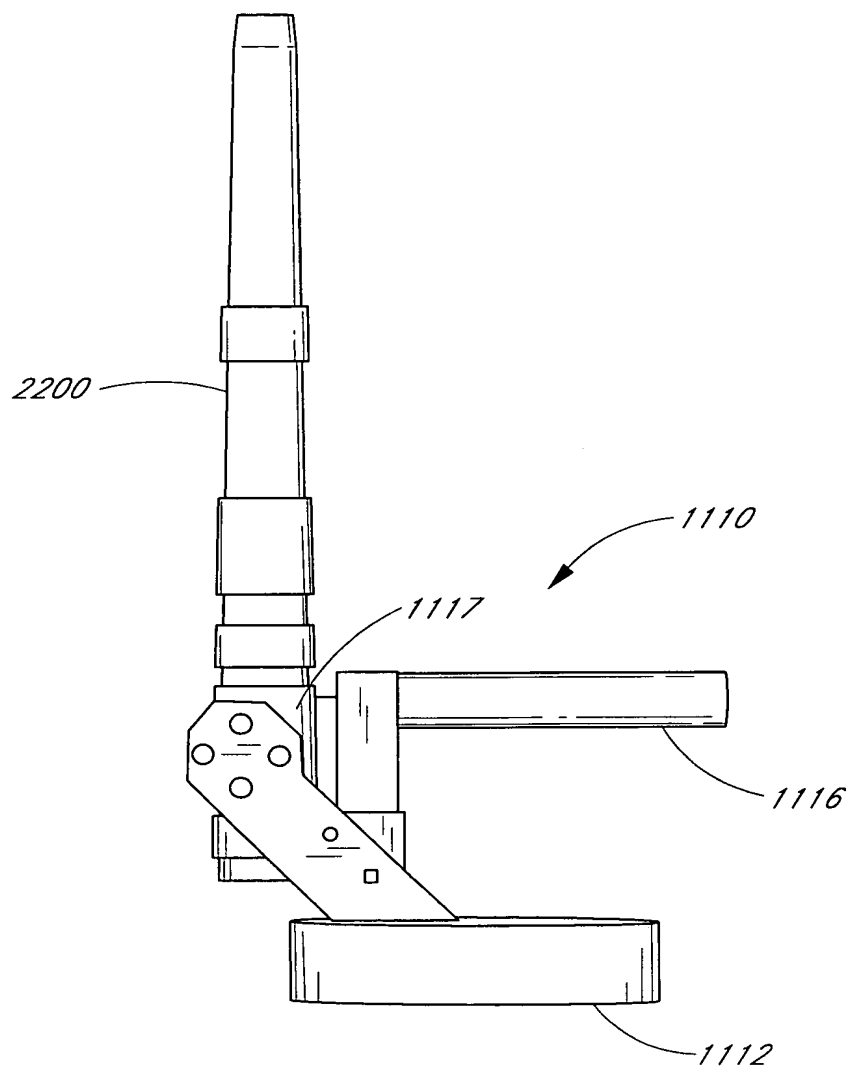


FIG. 21D

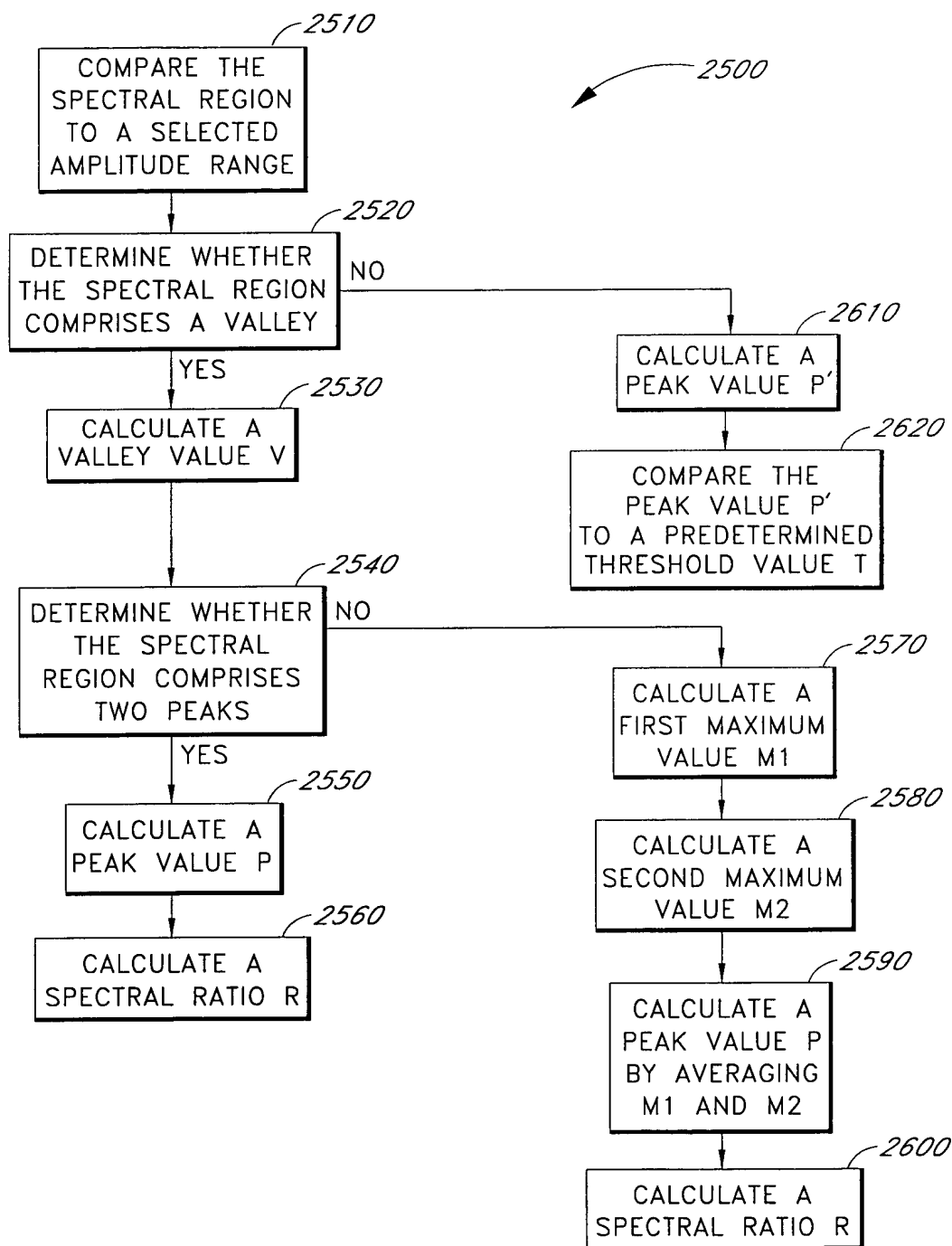


FIG. 22